EC2400 -Discrete systems

Instructor: Monique P. Fargues, Span 456
fargues@nps.navy.mil, *2859
office hours: posted or by appointment

Text: First Principles of Discrete Systems and Digital Signal Processing, Strum & Kirk, 1988, Prentice Hall.

Course objectives:

Introduction to sampled signals and discrete time systems, applied to digital signal processing. At the end of the course the student will be able to a) predict the behavior of a discrete time linear time invariant system; b) design a simple discrete time filter (lowpass, bandpass/stop, highpass); c) implement it in a MATLAB computer program

Grades: 3 tests, each worth 25%
1 comprehensive final, worth 25%

HWs: A few problems will be assigned on a regular basis to apply the various concepts covered in the classroom. Hws will not be collected, however they constitute an essential part of the learning process for the course. You are responsible for working on the problems as they get assigned to facilitate the understanding of the concepts covered in class. Solutions will be made available.

Exams:

All exams will be closed books/notes. One of the problems will be selected out of the HW sets. You will be allowed to bring in one one-sided (8.5*11") sheet on which you may write whatever you feel may be useful to you. For the final you will be allowed to a two-sided (8.5*11") sheet of notes.

Exam schedule:

Thursday 10/24
Thursday 11/14
Thursday 12/5

Make-up Classes: There will be no class 10/14-16. Make up classes will be announced in class.

Course outline:

Introduction to Signals and Systems: sequences, periodic signals, sampling theorem, systems (linearity, memory, time-invariance, causality, stability) (Chapter 2);

Linear Time Invariant Systems: Difference Equations, Impulse Response, Convolution, General Response of a Linear Time Invariant System, Total response (Chapter 3);

Frequency Response and Linear Filters: Steady State Response to a Sinusoidal Signal, Ideal Filters (Chapter 4);

Frequency Response from Pole/Zero Plots, Design of Simple Low/High Pass, Band Pass/Stop Filters Implementation (Chapter 5);

Solution of Linear Difference Equation Using z-Transform Methods: Z-transform definition and application to linear systems (Chapter 6)